

REMARKS

Claims 1413-1439, 1441-1445, 1447-1500, 1583, 1688, 1709, and 1751 are currently pending in the case. Further examination and reconsideration of the presently claimed application are respectfully requested.

Applicants note that a Notice of Appeal is filed concurrently herewith under separate paper. The Examiner is respectfully requested to enter the Notice of Appeal on the date of filing if the arguments presented herein are not found to be persuasive.

Section 103 Rejections:

Claims 1413-1420, 1424, 1433, 1436-1438, 1443, 1450-1451, 1478-1482, 1487-1488, 1500, 1583, and 1688 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,748,318 to Maris et al. (hereinafter "Maris") in view of U.S. Patent No. 4,468,120 to Tanimoto et al. (hereinafter "Tanimoto"). Claims 1421-1423, 1425-1432, 1434-1435, 1439-1442, 1444, 1445, 1447-1449, 1452-1477, 1483-1486, 1489-1499, 1709, and 1751 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Maris and Tanimoto and further in view of U.S. Patent No. 5,872,632 to Moore (hereinafter "Moore") and U.S. Patent No. 4,865,445 to Kuriyama et al. (hereinafter "Kuriyama"). As will be set forth in more detail below, the §103(a) rejections of claims 1413-1439, 1441-1445, 1447-1500, 1583, 1688, 1709, and 1751 are respectfully traversed.

To establish *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP 2143.03. Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion or incentive to do so. *In re Bond*, 910 F. 2d 81, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990). The cited art does not teach or suggest all limitations of the currently pending claims, some distinctive limitations of which are set forth in more detail below.

The cited art does not teach or suggest a system configured to determine at least three properties of a wafer that include a presence of macro defects on a back side of the wafer and a presence of micro or macro defects on a front side of the wafer. Independent claim 1413 recites in

part: "A system configured to determine at least three properties of a specimen during use,...wherein the second property comprises a presence of defects on the specimen, wherein the defects comprise macro defects on a back side of the specimen, wherein the defects further comprise micro defects or macro defects on a front side of the specimen, wherein the specimen comprises a wafer." Independent claims 1500, 1583, 1688, 1709, and 1751 recite similar limitations.

Maris discloses an optical stress generator and detector. Maris, however, does not teach or suggest a system configured to determine at least three properties of a wafer that include a presence of macro defects on a back side of the wafer and a presence of micro or macro defects on a front side of the wafer, for at least the reasons set forth in the Response to the Office Action filed in the present case on May 24, 2004 (hereinafter "the prior response"), which is incorporated by reference as if fully set forth herein.

Maris also cannot be combined with Tanimoto to overcome the deficiencies therein as suggested by the Examiner. For example, Tanimoto discloses a foreign substance inspecting apparatus. Tanimoto, however, does not teach or suggest a system configured to determine at least three properties of a wafer that include a presence of macro defects on a back side of the wafer and a presence of micro or macro defects on a front side of the wafer. The Final Office Action states that "Applicant's remarks, pages 18-19, argue that Tanimoto cannot detect defects on two sides of an opaque specimen such as wafer. The argument is not deemed to be persuasive because: (1) the present claimed invention does not recite an opaque specimen, claims must be examined on the basis of what they say, absent limitation may not be considered to be present." (Final Office Action -- page 7.) However, the teachings of Tanimoto must be considered in light of the inherent properties of the claimed wafer, which are consistent with the disclosure of the specification and the teachings of Tanimoto. "In determining whether the invention as a whole would have been obvious under 35 U.S.C. 103, we must first delineate the invention as a whole. In delineating the invention as a whole, we look not only to the subject matter which is literally recited in the claim in question...but also to those properties of the subject matter which are inherent in the subject matter *and* are disclosed in the specification..." *In re Antonie*, 559 F.2d 618, 620, 195 USPQ 6,8 (CCPA 1977) (emphasis in original). MPEP 2141.02. A wafer is described in the Specification, for example, on page 63, lines 6-27.

Tanimoto teaches that light of the light source used in the prior art systems will be regularly reflected by the patterned structures formed on the glass substrate of a reticle. For example, Tanimoto states that "the laser light 1 obliquely incident on a pattern surface S₁ having a light-intercepting layer 5b

applied to the glass substrate 5a of the photomask 5 is regularly reflected by the glass substrate 5a or the light intercepting layer 5b." (Tanimoto -- col. 7, lines 15-19.) As is known to one of ordinary skill in the art, light intercepting layer 5b is typically chromium (Tanimoto -- col. 6, lines 67-68), which as taught by Tanimoto is not transmissive to laser light 1 since the light is regularly reflected from the light intercepting layer 5b. In addition, Tanimoto also does not disclose that the light intercepting layer transmits any of the laser light, as shown in FIG. 4 of Tanimoto. Furthermore, by referring to the chromium structures as "the light intercepting layer," Tanimoto acknowledges that the chromium structures do not transmit the laser light. In addition, it would be obvious to one of ordinary skill in the art that light that is not transmitted by light intercepting layer 5b will also not be transmitted by a wafer. In particular, the laser light will not be transmitted by the wafer substrate. As such, laser light 1, when incident on a wafer, will not be transmitted through the wafer.

The Final Office Action also states that "the wafer does not have to be an opaque wafer because Tanimoto et al teaches that the transparent layer such as photomask is inspected and the photomask is a wafer (column 4, lines 41-43)." (Final Office Action -- page 7.) Tanimoto does state that "In a first embodiment of the present invention shown in FIG. 2, it is to be understood that the photomask 5 is a reticle, a mask or a wafer including a circuit pattern." (Tanimoto -- col. 4, lines 41-43.) However, as is well known to one of ordinary skill in the art, a photomask is not, in fact, a wafer. The fact that Tanimoto appears to suggest so is clearly an error in the teachings of Tanimoto as would be immediately apparent to one of ordinary skill in the art. In addition, teaching that a photomask is a wafer or vice versa amounts to assigning meanings to the terms that are repugnant (i.e., contradictory or inconsistent) to their usual meanings. While a term used in the claims may be given a special meaning in the description of the invention, generally no term may be given a meaning repugnant to the usual meaning of the term. *In re Hill*, 161 F.2d 367, 73 USPQ 482 (CCPA 1947). MPEP 2173.05(a). Therefore, a photomask cannot be defined as a wafer. Instead, Tanimoto appears to suggest that object 5 can be a reticle, a mask, or a wafer.

In any case, the teachings of Tanimoto only suggest that the first embodiment of the prior art invention can be used to inspect a wafer. In addition, as shown in Fig. 2 of Tanimoto and described in col. 4, line 41 - col. 6, line 58 of Tanimoto, Tanimoto teaches that only one side of such a specimen is inspected by the first prior art system embodiment. Consequently, Tanimoto teaches inspecting one side of a wafer.

In contrast, other embodiments of Tanimoto in which two sides of a specimen are inspected by passing light through the specimen are described by Tanimoto only with respect to a photomask, and more specifically with respect to a photomask formed of a glass substrate. For example, Tanimoto specifically states that "FIG. 4 illustrates the states of the scattering of the laser light by a foreign substance adhering onto the glass substrate of the photomask." (Tanimoto -- col. 7, line 3-5.) Tanimoto also states that "The light-receiving portion B is depicted as receiving the laser light directly passed through the glass substrate Sa." (Tanimoto -- col. 7, line 40-42.) Therefore, Tanimoto specifically teaches that the laser light passes through a glass substrate, which enables detection of defects on both sides of the glass substrate. In fact, Tanimoto specifically refers to a glass surface of a reticle as "the light-transmitting portion." (Tanimoto -- col. 1, line 57.) However, as is known to one of ordinary skill in the art, wafers are not formed of, or do not include, a glass substrate since glass is an insulating material. Instead, wafers are formed of a semiconductor substrate (or non-insulating substrate) such that semiconductor devices can be fabricated thereon. In addition, as is known to one of ordinary skill in the art, wafer substrates and glass substrates of photomasks necessarily have much different transmission characteristics. Consequently, it would not be obvious to one of ordinary skill in the art that the prior art systems of Tanimoto could be used to inspect both sides of a wafer since wafers have transmission characteristics, which unlike those of a glass substrate, will prevent laser light 1 from passing through the substrate.

In addition, the teachings of Tanimoto suggest the specimen-specific inspection capabilities of the prior art systems. In other words, Tanimoto suggests that only specimens that have light transmitting properties can be inspected on both sides by the prior art inventions. For example, Tanimoto states that "In an apparatus wherein one surface of an object to be inspected having a light transmitting property...there are provided first photoelectric means disposed so as to look to said one surface and to receive the scattered light emitted to said one surface side, second photoelectric means disposed so as to look to the other surface from which the light beam passed through the object to be inspected emerges." (Tanimoto -- col. 2, lines 26-38.) Therefore, Tanimoto specifically teaches that if the specimen is transmissive to the light, both sides of the specimen can be inspected. In addition, Tanimoto teaches that a glass substrate of a photomask is transmissive to the light. However, Tanimoto does not teach or suggest that a wafer is transmissive to the light. As such, Tanimoto does not teach or suggest inspecting both sides of a wafer with the prior art systems. Therefore, the teachings of Tanimoto do not suggest that both sides of a wafer can be inspected using the prior art systems since Tanimoto clearly teaches that only one side of a wafer can be inspected by the prior art systems.

Furthermore, there is no suggestion or motivation to modify the prior art system of Tanimoto such that Tanimoto teaches all limitations of the present claims. In particular, as set forth in more detail above, Tanimoto does not suggest that two sides of a specimen such as a wafer can be inspected since the teachings of Tanimoto suggest that "photoelectric means disposed so as to look to the other surface from which the light beam passed through the object to be inspected emerges" (Tanimoto -- col. 2, lines 35-37) would not receive any light since no light would pass through the wafer. As a result, this photoelectric means will not produce photoelectric signals. In addition, the systems of Tanimoto include "a detecting device for comparing the photoelectric signals of said first and second photoelectric means and producing a detection signal corresponding to the adherence conditions of the foreign substance." (Tanimoto -- col. 2, lines 38-42). Therefore, if one of the photoelectric means does not produce photoelectric signals, then the detecting device cannot produce signals corresponding to defects. Consequently, at least one of the detecting devices would be unusable for detecting defects on the wafer. Therefore, the principle of operation of the systems of Tanimoto, which can be used to detect defects on both sides of a glass substrate, would be modified if these prior art systems are used to inspect a wafer as suggested in the Final Office Action. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). MPEP 2143.01.

Additionally, there is no reasonable expectation of success in using the prior art system of Tanimoto to detect defects on both sides of a wafer. For example, as set forth in detail above, the teachings of Tanimoto suggest that a wafer will not transmit the laser light, and as a result, that the prior art systems of Tanimoto can be used to detect defects on only one side of a wafer. Therefore, Tanimoto cannot be modified or combined to reject the present claims as *prima facie* obvious as suggested in the Final Office Action since there is no reasonable expectation of success in doing so. The prior art can be modified or combined to reject claims as *prima facie* obvious as long as there is a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). MPEP 2143.02. Furthermore, since Tanimoto teaches that the laser light of the prior art system will be intercepted by a material such as chromium, one of ordinary skill in the art would recognize that the laser light of the prior art system will also be intercepted by a material of which a substrate of a wafer is formed. Therefore, one of ordinary skill in the art would understand that the prior art systems cannot detect defects on both sides of a wafer. As such, one of ordinary skill in the art would recognize that there is no reasonable expectation of success for using the prior art system of Tanimoto as suggested in the Final Office Action. Obviousness

does not require absolute predictability, however, at least some degree of predictability is required. Evidence showing there was no reasonable expectation of success may support a conclusion of nonobviousness. *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976). MPEP 2143.02.

For at least the reasons provided above, therefore, Tanimoto does not teach or suggest a system configured to determine at least three properties of a wafer that include a presence of macro defects on a back side of the wafer and a presence of micro or macro defects on a front side of the wafer, as recited in claims 1413, 1500, 1583, 1688, 1709, and 1751. Consequently, Tanimoto does not teach all limitations of claims 1413, 1500, 1583, 1688, 1709, and 1751 and cannot be combined with Maris to overcome deficiencies therein.

In addition, Maris and/or Tanimoto cannot be combined with Moore and/or Kuriyama to overcome the deficiencies therein for at least the reasons set forth in the prior response. Therefore, none of the cited art, either individually or in any combination thereto, teaches, suggests, or provides motivation for a system configured to determine at least three properties of a wafer that include a presence of macro defects on a back side of the wafer and a presence of micro or macro defects on a front side of the wafer, as recited in claims 1413, 1500, 1583, 1688, 1709, and 1751. Consequently, the cited art does not teach, suggest, or provide motivation for all limitations of claims 1413, 1500, 1583, 1688, 1709, and 1751, and *prima facie* obviousness of the present claims has not been established.

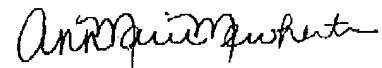
For at least the reasons stated above, claims 1413, 1500, 1583, 1688, 1709, and 1751 are patentably distinct over the cited art. Therefore, claims dependent therefrom are also patentably distinct over the cited art for at least the same reasons. Accordingly, removal of the § 103(a) rejections of claims 1413-1439, 1441-1445, 1447-1500, 1583, 1688, 1709, and 1751 is respectfully requested.

CONCLUSION

This response constitutes a complete response to the issues raised in the Final Office Action mailed August 3, 2004. In addition, the art cited but not relied upon is not believed to be pertinent to the patentability of the present claims. In view of remarks traversing rejections, Applicants assert that pending claims 1413-1439, 1441-1445, 1447-1500, 1583, 1688, 1709, and 1751 are in condition for allowance. If the Examiner has any questions, comments, or suggestions, the undersigned earnestly requests a telephone conference.

No fees are required for filing this amendment; however, the Commissioner is authorized to charge any additional fees, which may be required, or credit any overpayment, to Conley Rose, P.C. Deposit Account No. 50-3268/5589-02305.

Respectfully submitted,



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